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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Yoshitaka SASAKI et al.

Application No.: 10/057,946

Filed: January 29, 2002

Docket No.: 111836

For: THIN-FILM MAGNETIC HEAD AND METHOD OF MANUFACTURING SAME,
AND SLIDER OF THIN-FILM MAGNETIC HEAD AND METHOD OF
MANUFACTURING SAME

PRELIMINARY AMENDMENT

Director of the U.S. Patent and Trademark Office
Washington, D. C. 20231

Sir:

Prior to initial examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Page 21, line 14 to Page 22, line 14, delete current paragraph and insert therefor:

A method of manufacturing the second thin-film magnetic head of the invention is provided for manufacturing a thin-film magnetic head comprising: a conductor that is electrically connected to an external device; an induction-type electromagnetic transducer electrically connected to the conductor; and a body for accommodating the conductor and the induction-type electromagnetic transducer, wherein the body has a medium facing surface that faces toward a recording medium, and a back surface located on the opposite side from the medium facing surface. The method comprises the steps of: forming the conductor; and forming the induction-type electromagnetic transducer to be stacked on the conductor. The induction-type electromagnetic transducer has: a thin-film coil electrically connected to the conductor; first and second pole portion layers opposed to each other and disposed near the medium facing surface; a magnetic-path-forming part that is disposed so as to surround a part of the thin-film coil and couples the first pole portion layer and the second pole portion layer to each other; and a gap part provided between the first and second pole portion layers. Each

of the first and second pole portion layers has a protrusion for defining a recording track width, the protrusion having an end surface exposed in the medium facing surface. The thickness of each of the first and second pole portion layers defines a throat height.

Page 48, line 23 to Page 49, line 2, delete current paragraph and insert therefor:

Then, an insulating layer 82 made of alumina, for example, is formed over the entire surface to a thickness of 3 μm , for example. The insulating layer 82 is then polished by CMP, for example, so that the second shield layer 81 is exposed, whereby the surface of the insulating layer 82 is flattened.

Page 50, line 26 to Page 51, line 8, delete current paragraph and insert therefor:

The surface of the slider section 21 to be bonded to the reproducing head section 22 is, of the two surfaces resulting from cutting the first slider section aggregate 51A at the positions indicated by reference numeral 52 in FIG. 3, the one closer to the recording head 23. Meanwhile, the surface of the reproducing head section 22 to be bonded to the slider section 21 is the surface opposite to the surface that results from the grinding in the step shown in FIGS. 15A and 15B.

IN THE CLAIMS:

Please replace claims 9 and 32 as follows:

9. (Amended) A method of manufacturing a thin-film magnetic head comprising: a conductor that is electrically connected to an external device; an induction-type electromagnetic transducer electrically connected to the conductor; and a body for accommodating the conductor and the induction-type electromagnetic transducer, wherein the body has a medium facing surface that faces toward a recording medium, and a back surface located on the opposite side from the medium facing surface, and the conductor is exposed in the back surface, the method comprising the steps of:

forming the conductor; and

forming the induction-type electromagnetic transducer to be stacked on the conductor, the electromagnetic transducer having: a thin-film coil electrically connected to the

conductor; first and second pole portion layers opposed to each other and disposed near the medium facing surface; a magnetic-path-forming part that is disposed so as to surround a part of the thin-film coil and couples the first pole portion layer and the second pole portion layer to each other; and a gap part provided between the first and second pole portion layers,

each of the first and second pole portion layers having a protrusion for defining a recording track width, the protrusion having an end surface exposed in the medium facing surface, and the thickness of each of the first and second pole portion layers defining a throat height.

32. (Amended) A method of manufacturing a slider of a thin-film magnetic head according to claim 30, wherein, in the step of removing at least part of the wafer, the wafer is ground from the other surface thereof with a support plate placed on the plurality of reproducing heads.

REMARKS

Claims 1 - 32 are pending. By this Preliminary Amendment, the specification and claims 9 and 32 are amended. Prompt and favorable examination on the merits is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. 1.121(c)(1)(ii)).

Respectfully submitted,



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Attached: Appendix
Date: May 3, 2002

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APPENDIX

Changes to Specification:

Page 21, line 14 to Page 22, line 14:

A method of manufacturing the second thin-film magnetic head of the invention is provided for manufacturing a thin-film magnetic head comprising: a conductor that is electrically connected to an external device; an induction-type electromagnetic transducer electrically connected to the conductor; and a body for accommodating the conductor and the induction-type electromagnetic transducer, wherein the body has a medium facing surface that faces toward a recording medium, and a back surface located on the opposite side from the medium facing surface. The method comprises the steps of: forming the conductor; and forming the induction-type electromagnetic transducer to be stacked on the conductor. The induction-type electromagnetic transducer has: a thin-film coil electrically connected to the conductor; first and second pole portion layers opposed to each other and disposed near the first-medium facing surface; a magnetic-path-forming part that is disposed so as to surround a part of the thin-film coil and couples the first pole portion layer and the second pole portion layer to each other; and a gap part provided between the first and second pole portion layers. Each of the first and second pole portion layers has a protrusion for defining a recording track width, the protrusion having an end surface exposed in the medium facing surface. The thickness of each of the first and second pole portion layers defines a throat height.

Page 48, line 23 to Page 49, line 2:

Then, an insulating layer 82 made of alumina, for example, is formed over the entire surface to a thickness of 3 μm , for example. The insulating layer ~~82~~ 76 is then polished by CMP, for example, so that the second shield layer 81 is exposed, whereby the surface of the insulating layer 82 is flattened.

Page 50, line 26 to Page 51, line 8:

The surface of the slider section 21 to be bonded to the reproducing head section 22 is, of the two surfaces resulting from cutting the first slider section aggregate 51A at the positions indicated by reference numeral 52 in FIG. 3-2, the one closer to the recording head 23. Meanwhile, the surface of the reproducing head section 22 to be bonded to the slider section 21 is the surface opposite to the surface that results from the grinding in the step shown in FIGS. 15A and 15B.

Changes to Claims:

The following are marked-up versions of the amended claims:

9. (Amended) A method of manufacturing a thin-film magnetic head comprising: a conductor that is electrically connected to an external device; an induction-type electromagnetic transducer electrically connected to the conductor; and a body for accommodating the conductor and the induction-type electromagnetic transducer, wherein the body has a medium facing surface that faces toward a recording medium, and a back surface located on the opposite side from the medium facing surface, and the conductor is exposed in the back surface, the method comprising the steps of:

forming the conductor; and

forming the induction-type electromagnetic transducer to be stacked on the conductor, the electromagnetic transducer having: a thin-film coil electrically connected to the conductor; first and second pole portion layers opposed to each other and disposed near the first-medium facing surface; a magnetic-path-forming part that is disposed so as to surround a part of the thin-film coil and couples the first pole portion layer and the second pole portion layer to each other; and a gap part provided between the first and second pole portion layers,

each of the first and second pole portion layers having a protrusion for defining a recording track width, the protrusion having an end surface exposed in the medium facing

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surface, and the thickness of each of the first and second pole portion layers defining a throat height.

32. (Amended) A method of manufacturing a slider of a thin-film magnetic head according to claim 30, wherein, in the step of removing at least part of the wafer, the wafer is ground from the other surface thereof with a support plate placed on the plurality of reproducing heads.